REMARKS

Claims 1-25 are pending. All pending claims stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,785,521, Hadjichristos et al. Applicants respectfully disagree.

Claim 1 recites the following (with similar subject matter in the other independent claims, as is detailed below):

> A power amplifier module operable over a range of output power levels, comprising an output transistor having an input coupled to an input node of the power amplifier module and an output coupled to an output node of the power amplifier module, the power amplifier module further comprising circuitry for automatically compensating a load line of the output transistor for impedance variations appearing at the output node, the circuitry comprising detection circuitry for generating a **first detection signal** having a value that is indicative of the **current** flowing through the output transistor and a **second detection signal** having a value that is indicative of the **voltage** appearing at the output of the output transistor, and further comprising ***compensation circuitry*** for controlling the generation of a plurality of power amplifier bias current and bias voltage signals to have values that are a ***function of the values of the first and second detection signals, and the current output power level of the power amplifier module***.

Claim 1 (emphasis added).

In broad terms, a power amplifier module such as the one in claim 1 can determine current flowing through an output transistor, determine voltage at an output of the output transistor, and determine output power of the power amplifier module. In other words, independent claim 1 herein uses three items (current, voltage, *and* power) for a corresponding generation of bias current and bias voltage signals.

Hadjichristos does not disclose multiple elements of claim 1. FIG. 4 of Hadjichristos, for instance, uses a sense resistor 20 to determine a voltage that is comparable to the current (IPA) through the power amplifier 12. The current source 14 controls the current through the power amplifier 12, and the control amplifier 16 compares an amplitude modulated (AM) signal with the output voltage of the sense resistor 20 and then accordingly varies the current to the power amplifier, by controlling the pass transistor 18. In FIG. 4 of Hadjichristos, even if the resistor 20 could be considered as "a first detection signal having a value that is indicative of the current flowing through the output transistor", there is no

disclosure of "generating ... a second detection signal having a value that is indicative of the voltage appearing at the output of the output transistor", as there is no such generation of a signal having a value of the voltage appearing at the output of the pass transistor 18 (or the power amplifier 12). Further, even if the control amplifier 16 adjusts I_{PA} based on current flowing through the resistor 20/pass transistor 18, there is no disclosure in FIG. 4 of Hadjichristos of "controlling the generation of a plurality of power amplifier bias current and bias voltage signals to have values that are a function of the values of the first and second detection signals, and the current output power level of the power amplifier module", because there is no "second detection signal" that is indicative of the voltage appearing at an output transistor (such as pass transistor 18 in Hadjichristos) or disclosure of use of a current output power level of the power amplifier module.

The Examiner also cites FIG. 6 of Hadjichristos. In this figure, one of resistors 20A-20C is selected based on some level of current IPA. See col. 5, lines 3-16 and col. 5, line 51 to col. 6, line 21. When the "select" signal is used (see FIG. 6 of Hadjichristos), this signal simply selects one of the resistors 20A-20C based on known transmit power. However, selection of the resistors in no way changes the "bias" current of I_{PA}. Instead, the selection of resistors simply changes how much power will be lost in each resistor:

> As earlier noted, the sense resistor 20 provides the feedback signal based on developing a voltage drop proportional to the supply current I_{PA}. Reducing its resistance to a minimum value reduces the power lost in the sense resistor 20. Too small a resistance value will, however, yield undesirably low signal levels at the lower ranges of the supply current I_{PA}. One approach that satisfies these competing concerns is based on using a selected value sense resistor, e.g., 20A, 20B, or 20C, only within a given operating range of the supply current I_{PA}.

Hadjichristos, col. 5, lines 51-60. In other words, based on assumed I_{PA}, one can select the resistors 20A, 20B, or 20C.

The selection of the resistor may be made by the selection control circuit 24, which is a "simple magnitude circuit, that generates a selection signal based on control voltage generated by the control amplifier 16." Hadjichristos, col. 6, lines 11-15. The selection may also be made by external logic and coordinated with known transmit power ranges:

> An external selection signal may be used to control the switch 22 to selectively connect one of the set of sense resistors 20 into the supply current path. Such a signal might be generated by external logic. Logic generating the selection signal might be coordinated with known transmit power ranges.

Hadjichristos, col. 6, lines 8-11. Even if selection of the resistor 20A-20C is based on known transmit power ranges, all this means is that a different resistor 20A-20C is selected based on known transmit power ranges in order to reduce power lost through the resistor. The selection of the resistor 20A-20C has little if any effect on I_{PA} to the power amplifier 12.

Therefore, FIG. 6 and associated text of Hadjichristos does not disclose at least "generating ... a second detection signal having a value that is indicative of the voltage appearing at the output of the output transistor," as there is no disclosure of a detection signal having a value that is indicative of the voltage appearing at the output of the pass transistor 18. There is also no disclosure of "compensation circuitry for controlling the generation of a plurality of power amplifier bias current and bias voltage signals to have values that are a function of the values of the first and second detection signals, and the current output power level of the power amplifier module", as there is no disclosure of a detection signal having a value that is indicative of the voltage appearing at the output of the pass transistor 18. Nor is there disclosure of generation of a plurality of power amplifier bias current and bias voltage signals to have values that are a function of the current output power level of the power amplifier module, as at most FIG. 6 of Hadjichristos simply selects a resistor 20A-20C based on known transmit power ranges, and selection of the resistor does not modify I_{PA}. Even if selection of the resistor modified I_{PA} (which Applicants submit is not true), there is no disclosure of generation of a plurality of power amplifier bias current and ***bias voltage signals*** to have values that are a function of first and second detection signals ***and*** the current output power level of the power amplifier module, as there is no disclosure in Hadjichristos of generating power amplifier bias voltage signals at all and certainly no disclosure of generating power amplifier bias current and bias voltage signals based on three items.

There is no disclosure in Hadjichristos of "generating ... a second detection signal having a value that is indicative of the voltage appearing at the output of the output transistor". There is no disclosure in Hadjichristos of generation of a plurality of power amplifier bias current and ***bias voltage signals*** to have values that are a function of first and second detection signals ***and*** the current output power level of the power amplifier module.

There is also no disclosure in Hadjichristos of "compensation circuitry for controlling the generation of a plurality of power amplifier bias current and bias voltage signals to have values that are a function of ... ***current output power level of the power amplifier module***" as recited in claim 1. The Applicants have examined all of Hadjichristos and can find no disclosure of at least this subject matter.

Therefore, Hadjichristos lacks multiple elements of claim 1. Consequently, independent claim 1 is patentable over Hadjichristos.

The arguments given above with respect to claim 1 are equally valid with respect to the other independent claims. For instance, independent claim 9 recites the following:

> A method to operate a power amplifier module over a range of output power levels, comprising:
>
> generating a ***first detection signal*** having a value that is indicative of current flowing through an output transistor and a ***second detection signal*** having a value that is indicative of a voltage appearing at an output of the output transistor; and
>
> automatically compensating a load line of the output transistor for impedance variations appearing at an output node of the power amplifier module by controlling the generation of a plurality of power amplifier ***bias current and bias voltage signals*** to have values that are a function of the values of the ***first and second detection signals, and the current output power level of the power amplifier module***.

Claim 9 (emphasis added). There is no disclosure in Hadjichristos of generation of bias current and bias voltage signals having values that are a function of current flowing through an output transistor or current output power level of the power amplifier module. As already described above, there also appears to be no generation of bias voltage signals in Hadjichristos. There is also no disclosure in Hadjichristos of "automatically compensating a load line of the output transistor for impedance variations appearing at an output node of the power amplifier module by controlling the generation of a plurality of power amplifier bias current and bias voltage signals to have values that are a function of the values of the first and second detection signals, and the ***current output power level of the power amplifier module***". For at least these reasons, claim 9 is patentable over Hadjichristos.

Claim 17 is directed to a radio frequency (RF) power amplifier module, the RF power amplifier module comprising circuitry comprising detection circuitry for generating a first detection signal having a value that is indicative of the current flowing through the output transistor and a second detection signal having a value that is indicative the voltage appearing at the output of the output transistor, and further comprising compensation circuitry ***for controlling the generation of a plurality of power amplifier bias current and bias voltage signals to have values that are a function of the values of the first and second detection signals, respectively, and the value of a signal that is indicative of a current output power level of the RF power amplifier module***, further comprising an impedance matching circuit coupled between the output of the output transistor and the output node, the impedance matching circuit presenting a variable impedance that is controlled by an output signal from the compensation circuitry, where the output signal from the compensation circuitry is generated to have a value that is ***a function of the value of the first detection signal and the value of the signal that is indicative of the current output power level of the RF power amplifier module***. For at least these reasons, claim 17 is patentable over Hadjichristos.

Claim 20 is directed to a radio frequency (RF) power amplifier contained within a package, the RF power amplifier being operable over a range of output power levels specified by ***a value of a power control signal that is one of applied to a first input of the package and generated internally to the package***, the RF power amplifier comprising circuitry integrated with the at least one output transistor for automatically compensating the RF amplifier for impedance variations appearing at the first output, the circuitry comprising detection circuitry for generating detection signals indicative of current flowing through the at least one output transistor and of a voltage appearing at the output of the at least one output transistor, and ***further comprising load line compensation circuitry responsive to the detection signals and to the power control signal for maintaining a desired output linearity of the amplified RF signal***. For at least these reasons, claim 20 is patentable over Hadjichristos.

Claim 21 is directed to a mobile radiocommunication terminal comprising automatic compensation circuitry comprising detection circuitry for ***generating a first detection signal having a value that is indicative of the current flowing through the at least one output transistor and a second detection signal having a value that is indicative the***

voltage appearing at the output of the at least one output transistor, and further ***comprising bias control circuitry for controlling the generation of a plurality of power amplifier bias current and bias voltage signals to have values that are a function of the values of the first and second detection signals, respectively, and also the value of a signal that is indicative of a current output power level of the RF power amplifier module***, further comprising an impedance matching circuit coupled between the output of the at least one output transistor and the output node, the impedance matching circuit presenting a variable impedance that is controlled by an output signal from the automatic compensation circuitry, where the output signal from th***e automatic compensation circuitry is generated to have a value that is a function of the value of the first detection signal and the value of the signal that is indicative of the current output power level of the RF power amplifier module***. For at least these reasons, claim 21 is patentable over Hadjichristos.

As independent claims 1, 9, 17, 20, and 21 are patentable over Hadjichristos, dependent claims 2-8, 10-16, 18, 19, and 22-25 are also patentable over Hadjichristos. Applicants respectfully request the rejections under §102(e) to claims 1-25 be withdrawn. The Examiner is invited to call the undersigned if this would in any way further prosecution.

Respectfully submitted:

Robert J. Mauri
Reg. No.: 41,180

1/24/07
Date

Customer No.: 29683

HARRINGTON & SMITH, LLP
4 Research Drive
Shelton, CT 06484-6212
Telephone: (203)925-9400
Facsimile: (203)944-0245
email: rmauri@hspatent.com

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Elaine F. Miano
Name of Person Making Deposit

1/24/2007
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